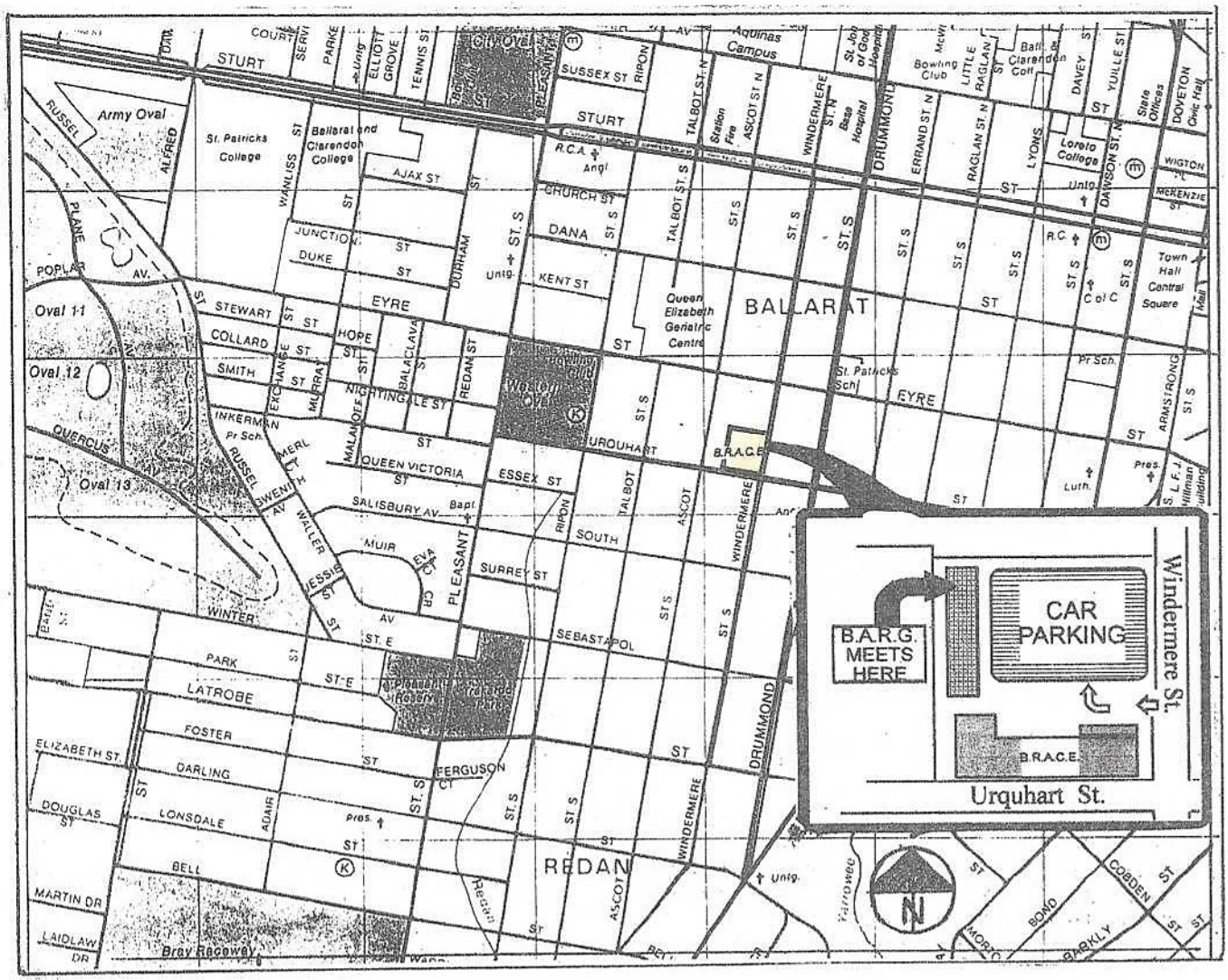
B.A.R.G. NEWS

MARCH 1995 VOL 18 NO 2.

NEWSLETTER OF THE BALLARAT AMATEUR RADIO GROUP INC.

NEW VENUE FOR B.A.R.G. ACTIVITIES

The Ballarat Adult & Further Education Centre (B.R.A.C.E.)
602 Urquhart St. Ballarat
(Cnr. Urquhart & Windermere Sts.)
CAR PARKING AT REAR



2

BALLARAT AMATEUR RADIO GROUP INC.

OFFICE BEARERS - 1994 / 1995

			☎ WORK	HOME
PRESIDENT	BOB TERRILL	VK3BNC		395317
VICE PRESIDENT	GORDON CORNELL	VK3FGC	391135	392427
IMM.PAST PRESIDENT	CLIFF BILSTON	VK3CCB	204321	361249
SECRETARY	GEOFF. SMITH	VK3ADB	358601	332112
ASST.SECRETARY	JIM WRIGHT	VK3CFB		327563
TREASURER	HARRY HEKKEMA	VK3KGL		357563
MEMBERSHIP SECRETARY	NORM D'ANGRI	VK3LBA		341613
NEWSLETTER EDITOR	NORM D'ANGRI	VK3LBA		341613
EDUCATION OFFICER	TOM GEORGE	VK3DMK	327234	
EXAMINATIONS OFFICER	CHARLIE STEWART	VK3DCS		317425
TECH. OFFICER	DICK ANTOZIEWICZ	VK3AEX		323273
TECH. OFFICER (DIGITAL)	TOM GEORGE	VK3DMK	327234	
MEMBERS' REP.	MARY CURNOW	VK3FMC		301927
MEMBERS' REP.	CLIFF BILSTON	VK3CCB	204321	361249
MEMBERS' REP.	REG CARTER	VK3CAZ		417585
QSL MANAGER	DOUG RAPER	VK3VBA		323565
NET CO-ORDINATOR	CLIFF BILSTON	VK3CCB	204321	361249
AWARDS MANAGER	MAURIE BATT	VK3XEX		422245
LIBRARIAN / HISTORIAN	RICHARD VOSS	VK3JFL		326048
PUBLICITY OFFICER	JEFF MULLER	VK3LU		328314
PROPERTY OFFICER	JEFF PIGDON	VK3PAP	311211	327041
WICEN COMMITTEE	GORDON CORNELL	VK3FGC	391135	392427
	GEOFF SMITH	VK3ADB	358601	332112
	TOM GEORGE	VK3DMK	327234	
TECHNICAL COMMITTEE	DICK ANTOZIEWICZ	VK3AEX		323273
	IAN McDONALD	VK3AXH		
	DICK FORRESTER	VK3VU	337080	357663
	DAVID McCONNELL	VK3YNB		
	BEN ORCHARD	VK3TOP		377836
	DEAN SPEEDIE	VK3LDS		332741
HAMVENTION CO-ORD.	TOM GEORGE	VK3DMK	327234	

LIFE MEMBERS: MAURIE BATT (VK3XEX), GEORGE SMALL (VK3DKJ) SK, KEVIN HUGHES (VK3WN), STAN WIDGERY (VK3SE), IAN McDONALD (VK3AXH), JIM WRIGHT (VK3CFB), PHIL SEDDON (VK3AQM)

CLUB STATION

VK3 BML

REPEATERS

VK3RBA (Voice)	146.750 MHz.	- Mt.Buninyong.
VK3RBS (Voice)	146.900 MHz.	- Smeaton Hill
VK 3RPC (Packet)	144.750 MHz.	- Mt.Warrenheip.
VK3RBU (Voice)	438.475 MHz.	- Mt.Hollowback.
VK3RMB (Beacon)	432.535 MHz.	- Mt.Buninyong

ACTIVITIES

CLUB NET: Thursday nights at 8 pm. (8.30 pm during Daylight Saving). Freq: 3.610 MHz +/- QRM.

2 METRE SCRAMBLE: Sunday Nights at 7.50 pm. Freq: 146.425 to 146.600 MHz. Inc,
Call back held on VK3RBA 146.750 MHz.

Logs **monthly** to D.Quirk - P.O. Box 78 - Newstead 3462 (or Meeting) to qualify.

MEETINGS: General Meeting : Last Friday of each month (except December) at 7.30 pm.
Natter Night : 2nd Friday of each month.
Venue: Ballarat Adult & Further Education Centre (BRACE) 602 Urquhart St. (Cnr.Windemere St.)

FOX HUNTING: As arranged during the year.

PLEASE ADDRESS ALL CORRESPONDENCE to:

The Secretary - BARG Inc.
Box 1261
Mail Centre
Ballarat 3354

DISCLAIMER
While every care is taken in the reporting of events and articles, BARG Inc.and its officers do not accept any liability for any disputed articles or expressed views or comments. Projects are assumed to have been validated by contributors. Reproduction by other Radio Clubs is permissable subject to acknowledgement.

The Minutes

MINUTES OF BARG MEETING HELD 24TH.FEBRUARY 1995

The meeting opened at 7.40pm. with President Bob welcoming members and visitors.

APOLOGIES were accepted on behalf of VK3's NIZ, DET, AXH, ANH, VU, XEX, VBA, SE, DS, ADX, KQQ, CUH, TDG. (KGC/CAZ)

MINUTES of the January meeting were tabled and confirmed. (DMK/AAP)

TREASURERS REPORT was presented and accounts passed for payment.
VHF Magazine. Concord Insurance. Newsletter Printing & Postage. Treasurers Expenses.
(CCB/DMK)

REPORTS were sadly lacking and President Bob reminded those concerned to ensure that reports were forwarded to the Newsletter Editor for inclusion in the Newsletter.

WICEN. Participants required for radio control of 'Fun Run' on 5th.March.
Operators required for RMIT CAR RALLY on 25th. March.

PRACTICAL NIGHTS. The format of our new series of Practical Nights was presented to the members by President Bob. The first night to be the 6th. March at BRACE.

MEETING ADJOURNED AT 8.12 pm.

GUEST SPEAKER. Our guest speaker was Maggie VK3CFI and she addressed the meeting with a very informative, enlightening and sometimes humorous discussion on 'Living with MIR'
Well done Maggie - We really enjoyed your talk.

MEETING RESUMED AT 9.30pm.

- Ben VK3TOP outlined proposals and operation of ATV repeater.
- Tom VK3DMK spoke of the developments & installation of 1st. link in digi-peater chain.
- Re-evaluation of UHF analyser to be done at Prac. Night.
- Video of ski-run and car rally available from Cliff VK3CCB.
- Chat by Tom VK3DMK re JVFAX.
- Generator to be serviced urgently.

MEETING CLOSED AT 10.02 pm. NEXT MEETING - March 31st.

A pleasant and informative evening - 73 de Geoff VK3ADB.

{{{{{{{{{{{ }}}}}}}}}}}

QUICKIES: The good thing about chickens is that you can eat 'em before their born, or after they're dead.

Me ? Indecisive ! - I'm not sure about that.

I read in the Bathroom. - Is that multi-tasking ?

I'm in great shape. - Round's a shape isn't it ?

HOW IS YOUR XTAL SET GOING ?

DO YOU NEED SOME MORE TIME ?

OK - You've Got It.

Our crystal set engineer and judge extraordinaire Tom VK3DMK , advises that because of his commitment to provide our syllabus item for the March meeting, together with the change in our meeting venue, it has been decided to defer the judging of the Great Cat's Whisker Competition until the fool's month of April.

So all of you who forgot all about it can now get cracking and whisk up a winner.

A GREAT PRE-LOVED RIG

KENWOOD TS 820S - 100 WATT HF TRANSCEIVER
DIGITAL DISPLAY - MC50 DESKTOP MICROPHONE
A GOOD BUY AT JUST $650.00

ALSO A MATCHING **KENWOOD AT200** ANTENNA TUNER
A STEAL AT $100.00

Contact Ian VK3FD - ☎053-358031 (A/H)

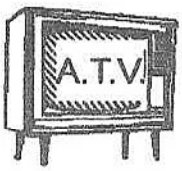
****

I HAVE A REQUIREMENT
FOR A **BATTERY TRAY**
TO RESTORE MY

KEN 202

IF YOU ASSIST COULD YOU GIVE ME A CALL ON ☎ 053-487709
CLEM - VK3BVI

****



BEN (VK3TOP) AND STAN (VK3SE) REPORT THAT AFTER SOME CONSIDERABLE EXPERIMENTATION THEIR ATV REPEATER IS NOW OPERATIVE ON A TESTING BASIS. THE OUTPUT FREQUENCY IS 426.250 MHz. AND THE LOCATION IS THE QUEEN ELIZABETH CENTRE. THEY WOULD APPRECIATE REPORTS. WELL DONE FELLAS!

The President Reports

Bob - VK3BNC

Our last meeting in the Hopetoun St. venue certainly will be one which we will recall with interest. We were grateful to Maggie VK3CFI, who captivated the audience with her stories of the Russian Space Station "MIR'. Maggie was our (BARG's) first lady amateur and has captured world attention with her exploits into packet radio, being the first amateur to connect to 'MIR'. Recently being invited to NASA to speak of her achievements must be seen as a feather in her cap (Hat). Congratulations Maggie and thanks for your most interesting talk.

I am not sure if it was with a sigh of relief that Ben announced that the 'ATV' project is now up and running. Congratulations Ben and Stan. It's been a long haul but rewarding I'm sure. Ben's obvious enthusiasm for the project came through in his report at our meeting. It's an exciting project and if any of our members want to help out, particularly on the programming side, please put your hand up. This is a great opportunity to bring 'Amateur Radio' into the homes of potential amateurs throughout Ballarat. If you haven't already tried, then see if your VCR will tune down to 426 Mhz. Contact Ben VK3TOP or Stan VK3SE to arrange for a signal and they will be most interested to get reports. Thanks again Ben and Stan for a great job.

Our first 'Prac.Night' was given over to the mysteries of running 'Graphic Packet'. Tom VK3DMK brought along his packet setup and was able to help some of our members along the road to self sufficiency in this interesting facet of our hobby. With these facilities at our disposal I hope that our members will endeavour to make use of them. Tom will continue in this area with a look at 'JVFAX'. This is another exciting aspect of our hobby and if you have access to a computer then slow scan TV is at your finger tips.

Our BRACE class is progressing nicely and although only small, the results I'm sure will be excellent.

As we settle into our new venue I hope that we will continue to expand our horizons. A permanent facility may even be possible on this site.

A word on our packet scene. The linking project is drawing to finality and I understand that VK3ATL will be moved soon to their own frequency, which will relieve the congestion that we are all presently experiencing on 144.750 Mhz.

The 'John Moyle' will have come and gone by the time that we read our Newsletter but I know that several of our members will be taking part in this popular contest, so good luck to them and we will be interested to see the outcome.

On a more serious note you will be disappointed to know that the famous "DNA", Danny , will have departed to VK4. Danny has endeared himself to us all and we will miss his dry (twisted) sense of humour. We will be looking for the VK4 call Danny and those cryptic messages on packet. Best of luck Danny from all of your friends at BARG.

And with the "Begonia Run' and the 'RMIT' car trial, it has been a busy month. Look forward to seeing you all at our first meeting in the BRACE venue.

73 de Bob VK3BNC.

6

Make Friends with a dB.

Understanding and using a convenient unit of measure.

by Charles Henry VF2AH - "QST" March 1976

Decibels are such pleasant, lovable and easy to get along with chaps that it is a shame they are so little understood by some hams. DB's are everywhere, from the "20 dB over S9" report, to the "the new Whoopendoofer has a gain of X dB". The purpose of this article is not to teach you how to speak dB, but rather to give an understanding of basic conversation - somewhat like learning how to order a meal in a foreign language, very useful.

Why do so few hams invite dBs into their shacks ? Perhaps the reason is because whenever one tries to become friendly he is given a definition - something about a ratio coupled with a formula that somehow does not look as though it has much practical usage.

dB as a Ratio of Power

Fact No.1: Every time you increase your power by 3dB you double it.

Fact No.2: When you increase your power by 10dB you multiply it by 10.

EXAMPLE 1	
Transmitter Power	100 Watts
Increase by 3 dB	200 Watts
Increase another 3 dB	400 Watts
Increase another 3 dB	800 Watts
Increase by 1 dB	1000 Watts

Fine, you say, but how come the last increase of 1dB pushed the power from 800 to 1000 Watts ?

1 dB INCREASE —X BY	1.25
2 dB	1.58
3 dB	2.00
4 dB	2.51
5 dB	3.16
6 dB	3.98
7 dB	5.01
8 dB	6.31
9 dB	7.94
10 dB	10.00

DBM

If you are still following, you will know that if a person were lucky in the stock market and increased his wealth by 3 dB, he had doubled his money. However , you don't have a clue as to whether he is a millionaire or has a total wealth of just a few bucks. This is because there is no reference point to which the 3 dB increase may be compared. In the previous examples we were using the dB to find a multiplier; however in this case it is more useful to talk **dBm** (decibels relative to one milliwatt) instead of Watts.

DB's can be simply added and subtracted from the dBm unit.

A standard reference for rf work is 0 dBm which is equal to 1 milliwatt, through, say 50 ohms. From this the following is calculated:

0.001 Watt =	0 dBm
0.01 Watt	+10 dBm
0.1 Watt	+20 dBm
1 Watt	+30 dBm
10 Watts	+40 dBm
100 Watts	+50 dBm
1000 Watts	+60 dBm

Note that the rules did not change, since each 10 dB increase multiplied the power 10 times. Assume that your transmitter is running at the +50 dBm (100 Watt) level and you increase the power by 3 dB. The transmitter is now running at +53 dBm. If you wish to convert back to Watts, the +50 dBm is equal to 100 Watts and the multiplier for 3 dB is 2. Therefore the transmitter is running 200 Watts.

Example:

You have kept a sked with your mate Joe for years, and invariably he is one S unit (5 or 6 dB) stronger than you. This being a hypothetical case, let's say that you don't want a stronger signal than his, but you want your signals to be equal. You are running 180 Watts to a dipole, and Joe runs 280 Watts to a 3 dB gain antenna. What must you do to get your signal up on a level with his ? Obviously run 280 Watts and a 3 dB gain antenna, right? Not necessarily! Let's convert this problem into dB language so we can understand what is going on:

180 Watts	+52.6 dBm
Dipole (reference)	0 dB gain
280 Watts	+54.5 dBm
Beam Antenna	3.0 dB gain

It appears that you must increase your signal by approximately 5 dB to match things up, right ? Not quite. Calculating the signal levels at Joe's receiver, disregarding losses, we get:

Transmitter Power	+52.6 dBm
Your Antenna gain	0 dB
His Antenna gain	3.0 dB
Total	+55.6 dBm

The signal level that is transmitted from Joe's station and received at yours will be:

Transmitter Power	+54.5 dBm
His Antenna gain	3.0 dB
Your Antenna gain	0 dB
Total	+57.5 dBm

Remember that a gain antenna not only increases your effective radiated power but also increases the level of signals received in the favoured direction of the beam. From the foregoing it can be seen that an additional 1.9 dB of gain at your station would be required to equalise the two received signal levels. If you put up an antenna with a 1.9 dB gain your signal level would increase; however Joe's signal level would also increase by 1.9 dB at your end. In keeping with our hypothetical case where we want the received signals to be the same, it would be necessary to increase your transmitter power by 1.9 dB and not your antenna system. In other words you would have to run approximately 280 Watts to equalise the two signals.

Antennas

One often sees antenna advertisements quoting miraculous dB gain figures. Gain relative to what ? A paperclip ? Once again a reference is needed; otherwise the number is meaningless. Two standards of reference when dealing with gain in the Antenna field are *gain over an isotropic radiator* (dBi) or *gain over a dipole* (dBd) The gain of a dipole over an isotropic radiator is 2.1 dB. Thus a particular antenna could be rated as having a gain of 3 dBi or 5.1 dBd. Either is perfectly correct, but beware if the "d" or "i" is not there as you could be buying an antenna with a 10 dB gain over an 'orange pip'!

The next time you're given a 59 plus 20 dB report try reducing your power by 100, e.g. from 100 Watts to 1 Watt and see if you are S9 on the other guy's meter.

Whenever you read a specification sheet, give a little consideration to the dB figures and consider if you are getting your money's worth or if the manufacturer has re-invented the laws of physics.

JOHN MOYLE FIELD DAY
February
1981

The B.A.R.G. operated a portable field station at Flagstaff Hill, near Linton, on the 7th. & 8th. February 1981. The camp was set up with 3 tents, 2 caravans and a panel van. Approximately 20 members attended at various times over the weekend. The following bands were operated with good results:

160M -	8 cont. - 43 pts.	15M -	177 cont. - 1108 pts
80M -	102 - 1468	10M -	193 - 1285
40M -	161 - 2397	6M -	27 - 203
20M -	94 - 787	2M -	80 - 540

I've made a rig, It's very good,
The first one made by me,
I'm told it doesn't chirp or click,
It's QRP you see.

Every night I *dah dah dah*,
And *dit* as well of course,
Sending out my signal,
Which has to be in Morse.

I hope and pray for contacts,
Sending with just one Watt,
But no one wants to talk to me,
QRP or not.

So if you care to listen,
On 3 point 580,
Try to spare a minute,
Just to say "Hello".

73 de Eric VK3FRO

THEY SAY

* A day without sunshine is like night.
* i nevver maek misstakeS.
* That *denial* is a river in Egypt.
* We're born free - but taxed to death.
* Multitasking causes schizophrenia.
* Radioactive cats have 18 half lives.

FIND A *RADIO*WORD

CAPACITOR
REFLECTOR
COAXIAL
RESONANCE
BIAS
LINEAR
BALANCED
TRACE
OSCILLATOR
CRYSTAL
RINGO
FACSIMILE
CONNECTOR
ANODE
SCREEN
CAVITY
QUAD
MODEM
AMPLIFIER
GRID

N	K	V	B	P	R	E	I	F	I	L	P	M	A	D	R	Y	W	O	I
L	I	N	E	A	R	C	M	Z	I	O	V	O	Z	L	R	X	B	Z	S
A	F	Q	Y	T	F	H	W	Y	C	A	P	A	C	I	T	O	R	O	Y
H	J	D	T	L	F	M	N	O	W	J	T	Z	H	A	P	R	H	A	C
M	Q	O	I	D	W	S	H	G	E	S	N	L	L	P	N	L	U	O	M
H	I	N	V	E	W	L	J	U	X	T	R	M	C	C	J	O	D	M	K
B	W	E	A	C	I	B	H	N	D	H	Q	U	A	D	X	D	D	M	O
O	J	E	C	N	P	T	Y	R	E	F	L	E	C	T	O	R	S	E	S
Q	J	R	R	A	I	U	M	W	K	I	H	L	U	M	E	M	O	I	C
C	P	C	V	L	D	H	T	V	E	B	A	V	Z	O	I	E	I	H	I
E	G	S	R	A	Q	O	K	O	P	T	O	Y	M	A	R	D	H	R	L
D	L	R	G	B	C	C	G	B	S	U	R	Z	K	E	H	O	A	I	L
I	O	Q	A	I	E	Q	Y	Y	B	O	V	W	S	X	O	M	H	N	A
R	E	B	W	U	Y	W	R	H	T	Z	L	O	O	Y	R	E	H	G	T
G	W	K	X	G	Y	C	T	C	F	Q	N	B	I	A	S	P	Y	O	O
T	Q	K	H	H	Z	D	E	G	S	A	F	B	A	Y	V	G	X	N	R
E	G	X	P	X	G	N	R	W	N	C	O	A	X	I	A	L	U	A	W
T	S	T	I	V	N	O	T	C	D	E	L	I	M	I	S	C	A	F	I
R	F	B	J	O	W	C	E	I	V	Y	S	A	W	E	I	H	R	Y	D
A	U	C	C	I	O	U	V	Q	T	R	A	C	E	E	T	G	C	C	T

HEWITT WHITTY

CORNER CARNGHAM RD. AND WILTSHIRE LANE

CASTROL DISTRIBUTOR:

SUPER TT FOR 2 STROKE MOTORS - *THE BEST THERE IS.*

GLASS AND CHROME CLEANER FOR WINDOWS - *TRY IT.*

GTX2 FOR MOTOR VEHICLES - *TOP LINE - LOW PRICE*

HARDIE GARDEN SPRAYERS - 5 AND 8 LITRE CAP.
SIMPLE - STURDY - EFFICIENT.
They're not cheap but there's none better.

ECHO BRUSHCUTTERS - FULL RANGE IN STOCK
LIFETIME GUARANTEE ON MOTOR
One free service adjustment

GLYPHOSPHATE (READ - ROUNDUP) HERBICIDE
1 LITRE, 2.5 LITRE, & 5 LITRE CONTAINERS
1 Litre Makes 100 Litres

73 de Bill VK3PH

BALLARAT PAGING & COMMUNICATIONS
A Division of Robert Bell & Associates Pty.Ltd. ACN 006 956 501

TWO-WAY COMMUNICATIONS SPECIALISTS

OPTUS PREMIUM DEALER

053 - 31 7922

32B DOVETON STREET NORTH - BALLARAT

ICOM
MOTOROLA
TAIT
KENWOOD
UNIDEN

THIS NEWSLETTER HAS BEEN PRINTED BY

SUPERRUN PRINTS

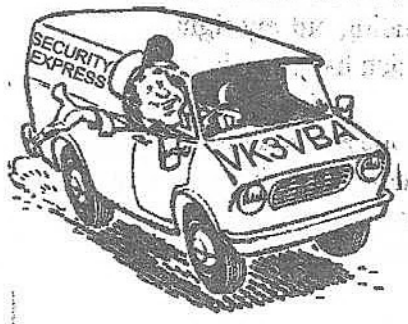
Printing
Screenprinting
Tee Shirt Prints

John Graham

053-391097

SECURITY EXPRESS

A DIVISION OF MAYNE NICKLESS LTD.



COUNTRY COURIER SERVICES

SPECIALISTS IN
DOOR TO DOOR - VICTORIA WIDE
MAILBAG & PARCELS

OVERNIGHT - BALLARAT - VIC. COUNTRY
SKIPTON - BEAUFORT - DAYLESFORD

STATE OFFICE:
BUILDING 198
CNR.HAMMOND AVE. & BRISTOL AVE.
ESSENDON AIRPORT.

ENQUIRIES

CALLFREE
GEELONG 1800 645252

9 - 11 RODNEY RD.
NORTH GEELONG
FAX 78 5148

OR CONTACT
BALLARAT AGENT.
IAN LEISHMAN
018 503682

Let's Experiment with An ATV Antenna

Try this Yagi design - based on Feb 1988 AR, & VHF Comm. 3/82.

Using elements through a metal boom 19.00 mm. in diameter.
Yagi design Frequency = **426.000 MHz.** Wavelength = 704 mm.
Director / Reflector Diam. = 3.25 mm. Radiator Diam. = 3.25 mm.
REFLECTOR = 356 mm. long - spaced 169 mm. from radiator.
SINGLE RADIATOR = 339 mm. or **FOLDED RADIATOR** = 670 mm.

DIRECTOR NO.	LENGTH (mm.)	SPACING (mm.)	BOOM (mm.)	GAIN (dBd)
1	319	53	222	5.2
2	316	127	349	6.8
3	313	151	500	8.0
4	310	176	676	9.0
5	307	197	873	9.9
6	305	211	1085	10.6
7	302	222	1306	11.2
8	300	232	1539	11.8

BOB VK3BNC

IT MAY NEVER HAPPEN - LET'S HOPE IT DOESN'T BUT IF IT DOES IS THERE A PROBLEM ?

(A summary of potential problems that could hinder a disaster response.)
Condensed from an article in the WICEN Newsletter.Feb '95.

1. WATER Could be contaminated.
2. POWER May be interrupted or may fail.
3. BATTERIES Will go flat.
4. FUEL Will not be available.
5. MOST PROBLEMS will occur in the DARK.
6. IDENTIFICATION of workers will be a problem.
7. DOCUMENTATION & VERIFICATION of accurate information is a must.
8. FLAT TYRES occur in rough areas.
9. PARKED VEHICLES belonging to operators might block access.
10. You might get LOST.
11. I should mention that you might also get HUNGRY.

Thanks to John VK3CFH for these reminders

CONSIDER YOUR strategy and equipment to meet these types of problems and refer to the WICEN Newsletter for February '95. for a more complete list of the 'unexpected'.

10

COMING EVENTS AND INFORMATION

March 5th.	Begonia Classic Run.
March 6th.	Practical Construction Night No.1 (At BRACE)
March 10th.	Natter Night. (At BRACE)
March 13th.	Practical Construction Night No.2
March 15th.	BARG Committee Meeting.
March 18th./19th.	WIA John Moyle Field Day
March 20th.	Practical Construction Night No.3
March 25th.	RMIT Car Rally.
March 27th.	Practical Construction Night No.4
March 29th.	WICEN Training Night (Venue: SES Faciity in Gillies St.- Near RSPCA)
March 31st.	BARG General Meeting. (VK3DMK - Wind Generators)

B.A.R.G.

THE BALLARAT AMATEUR RADIO GROUP INC.

A GROUP OF RADIO ENTHUSIASTS LICENSED TO EXPERIMENT
WITH LOCAL & INTERNATIONAL RADIO COMMUNICATIONS ON AN AMATEUR BASIS.

NEW MEMBERS ALWAYS WELCOME

10

OFFICIAL NEWSLETTER OF THE BALLARAT AMATEUR RADIO GROUP INC.

B.A.R.G. NEWS

SURFACE MAIL

IF UNDELIVERABLE PLEASE RETURN TO
P.O. BOX 1261
MAIL CENTRE
BALLARAT 3354